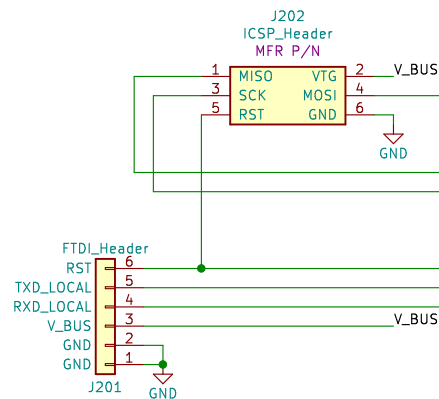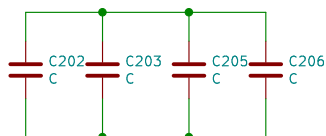Sheet: Arduino

□ +5V

File: Flamingo PCB − Arduinosch.sch

Sheet: Power

File: Flamingo PCB − Power.sch

Sheet: IMU

File: Flamingo PCB − IMU.sch

Paul Blackburn

Sheet: /
File: Flamingo PCB.sch

Title: Flamingo PCB

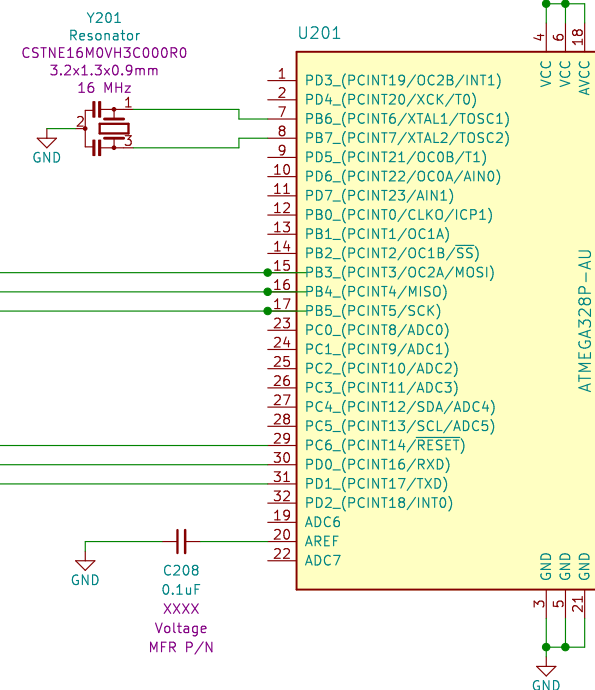| Size: USLetter | Date: 2020−09−29 | **Rev: 3** |
| KiCad E.D.A. kicad (5.1.7)−1 | | Id: 1/4 |

COG dielectric, ultra stable cerapic cap, 12 — 22 pF, qty 2, both the same

C201
C

C204
C

100 nF X7R ceramic capacitors rated for at least 16 volts.
decoupling capacitor for each VCC pin.

C202   C203   C205   C206
C   C   C   C

Y201
Resonator
CSTNE16M0VH3C000R0
3.2x1.3x0.9mm
16 MHz

GND

+5V

U201

Pin	Signal
1	PD3_(PCINT19/OC2B/INT1)
2	PD4_(PCINT20/XCK/T0)
7	PB6_(PCINT6/XTAL1/TOSC1)
8	PB7_(PCINT7/XTAL2/TOSC2)
9	PD5_(PCINT21/OC0B/T1)
10	PD6_(PCINT22/OC0A/AIN0)
11	PD7_(PCINT23/AIN1)
12	PB0_(PCINT0/CLKO/ICP1)
13	PB1_(PCINT1/OC1A)
14	PB2_(PCINT2/OC1B/SS)
15	PB3_(PCINT3/OC2A/MOSI)
16	PB4_(PCINT4/MISO)
17	PB5_(PCINT5/SCK)
23	PC0_(PCINT8/ADC0)
24	PC1_(PCINT9/ADC1)
25	PC2_(PCINT10/ADC2)
26	PC3_(PCINT11/ADC3)
27	PC4_(PCINT12/SDA/ADC4)
28	PC5_(PCINT13/SCL/ADC5)
29	PC6_(PCINT14/RESET)
30	PD0_(PCINT16/RXD)
31	PD1_(PCINT17/TXD)
32	PD2_(PCINT18/INT0)
19	ADC6
20	AREF
22	ADC7

ATMEGA328P-AU

VCC VCC AVCC
4   6   18

GND GND GND
3   5   21

GND

J202
ICSP_Header
MFR P/N

1	MISO	VTG	2	V_BUS
3	SCK	MOSI	4	
5	RST	GND	6	

GND

C207
0.1uF
Voltage
XXXX
MFR P/N

+5V

R201
10k
0603
RC0603FR-0710KL

FTDI_Header
RST   6
TXD_LOCAL 5
RXD_LOCAL 4
V_BUS   3
GND   2
GND   1
J201

GND

V_BUS

GND   C208
       0.1uF
       XXXX
       Voltage
       MFR P/N

I expect both the ICSP and FTDI headers to supply 5V, either or, etc.

10118194-0001LF would have been nicer,
as it says 4 DIP legs, vis this SMT plus 2 DIP,
but was shipping like 3 months out when I made this

TODO:
CHECK POLARITY

TODO:
NEED TO FIND A GOOD SOCKET FOR THE SWITCH CABLE
MIGHT JUST NOT POPULATE AND SOLDER DIRECT

J?
JST PH Battery Connector

GND

battery

J?
10103594-0001LF

V_BUS also comes
from the UART header

□ V_BUS

PWR_FLAG

C?
10uF
16V
0805
GRM21BR61C106KE15L

GND

SH

PWR_FLAG   GND

U?
LiPo Charger 500 mA
MCP73831T-2ATI/OT
4.20 V

4 VDD   VBAT 3
1 STAT VSS PROG 5
       2

GND

D?
Red/Charging
0603
LS L29K-G1J2-1-Z

Vf = 1.8V, 2 mA typ
5V=1.8 = 3.2V
3.2V/1.5k = 2.1 mA

R?
1.5k
0603
RC0603FR-071K5L

R?
1.5k
0603
RC0603FR-071K5L

HIGH when
charging is done

Vf = 1.8V, 2 mA typ
5V=1.8 = 3.2V
3.2V/1.5k = 2.1 mA

D?
Green/Done
0603
LG L29K-F2J1-24-Z

GND

JP?
Solder Jumper

R?
2.49k
0603
RC0603FR-072K49L

R?
10k
0603
RC0603FR-0710KL

GND

Open: 10k = 100 mA
Closed: 2.0k = 500 mA

Batt charging rate:
10k = 100mA   *
5.0k = 200 mA
2.0k = 500 mA   *
1.0k = 1000mA

Adafruit typically does 0.5C for their batteries
2500 mAh capacity - 1200 mA charge current

□ V_BAT
4.20 V max

PWR_FLAG

C?
10uF
16V
0805
GRM21BR61C106KE15L

GND

Q?
P-Channel 1.25-W MOSFET
Si2301DS

V_BAT □
4.20 V max

V_BUS □

3   2
  1

R?
100K

GND

D?
BAT60A

J?
Wire Switch Here

□ V_OUT

PWR_FLAG

C?
10uF
16V
0805
GRM21BR61C106KE15L

GND

1) Charge battery while running: V_BUS at 5V, battery connected, switch on.
2) Charge battery while not running: V_BUS at 5V, battery connected, switch off.
3) Run on USB only: V_BUS at 5V, battery not connected, switch on.

U501
3.3V_Reg
LP2985-33DBVR
150 mA

V_OUT □

C501
10uF
XXXX
Voltage
MFR P/N

GND

1 VIN   VOUT 5
3 ON/OFF GND BYP 4

GND

C503
10uF
XXXX
Voltage
MFR P/N

□ +3.3V

GND

U502
1.8V_Reg
LP2985-18DBVR
150 mA

V_OUT □

C502
10uF
XXXX
Voltage
MFR P/N

GND

1 VIN   VOUT 5
3 ON/OFF GND BYP 4

GND

C504
10uF
XXXX
Voltage
MFR P/N

□ +1.8V

GND

Datasheet suggests a Schottky to avoid reverse biasing Vin/Vout if that is a possibility but I don't expect that to happen.

Sheet: /Power/
File: Flamingo PCB - Power.sch
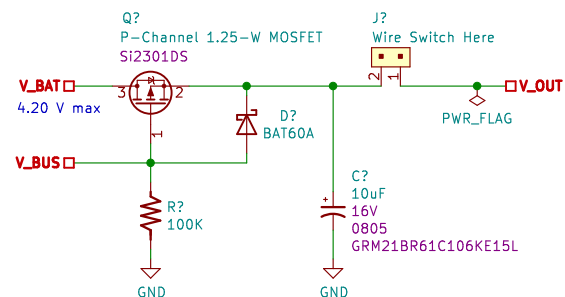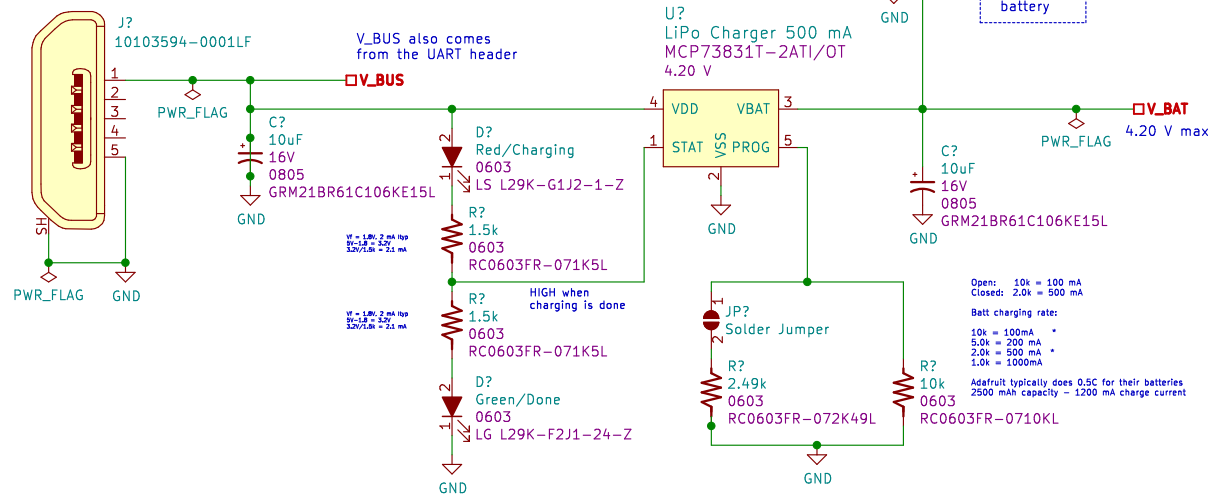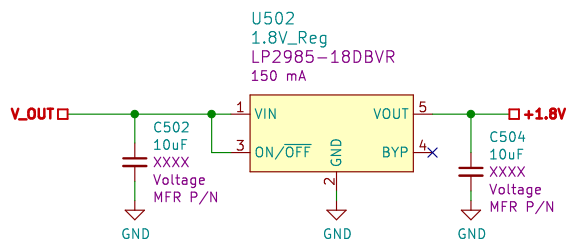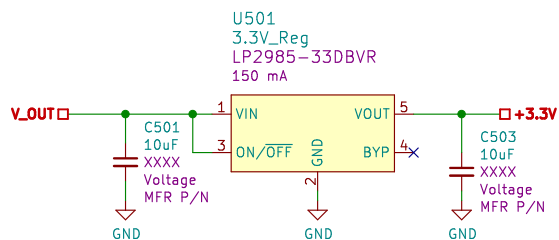
Title:

Size: A4   Date:
KiCad E.D.A. kicad (5.1.7)-1

Rev:
Id: 4/4